

XII). CLAIMS:

1. I claim an invention which is specialized for use in a low cost, low security environment with both unattended and attended operation with means for specialized post-crime, suspect identification using digital, audio/video security recording which is composed of the elements of:

a camera body,

a closed loop servo-motor controlled passively auto-focused camera lens optimized for motion video use, furthermore with means for use as a gain-box (G-box),

a closed loop servo-motor controlled passively auto-focused camera lens optimized for still photographic use, furthermore with means for use as a gain-box (G-box),

a transmissive motion sensor,

a micro-processor with means for output compressed digital data stream final assembly, furthermore with means for very rapid closed loop servo-motor control processing of the H-boxes and the G-boxes, furthermore with means for suspect motion computer modeling,

peripheral input/output (I/O) bus and timing circuitry,

micro-processor input/output I/O peripheral chips,

a passively focused Moving Picture Expert's Group X like (MPEG X-like) optimized both infrared and visible light receptive charge coupled device (MPEG-like CCD) which is used with means as a hold-box (H-box) signal generator for closed loop servo motor control algorithms executed in the micro-processor used in lens servo-motor control,

a passively focused Joint Photographer's Expert's Group like (JPEG-like) optimized visible light receptive charge coupled device (JPEG CCD) which is used with means as a Hold-box (H-box) signal generator for closed loop servo motor control algorithms executed in the micro-processor used in lens servo-motor control,

a high rate analog to digital converter (ADC) with means for converting the MPEG X-like charge coupled device (CCD) output analog audio and video signals to digital with means for micro-processor bus input into the dedicated digital compression circuitry, furthermore with means to act as a hold-box (H-box) for closed loop servo-motor MPEG X-like lens control,

a low rate analog to digital converter (ADC) with means for converting the JPEG X-like charge coupled device (CCD) output analog video signals to digital with means for micro-processor bus input into the dedicated digital compression circuitry,

furthermore with means to act as a hold-box (H-box) for closed loop servo-motor JPEG X-like lens control,

a very low rate analog to digital converter (ADC) with means for converting the two channels of analog audio from a line amplified micro-phone into MPEG X-like digitized audio with means for micro-processor bus input into the dedicated digital compression circuitry,

a MPEG X like specialized digital compression circuit,

a JPEG X like specialized digital compression circuit,

dynamic random access memory (DRAM) for temporary data store with means for holding large 6 mega pixel JPEG X-like frames,

electrically erasable programmable read only memory (EEPROM) for permanent computer program store,

static RAM (SRAM) for small amounts of fast micro-processor program variables storage,

a first in first out buffer (FIFO),

a removable permanent memory storage device for digital data with first example means of a digital video tape cassette,

a power supply,

which elements are electronically and mechanically combined together into a specialized, hybrid simultaneously recorded JPEG like and MPEG X like digital audio/video camera, which furthermore simultaneously produces a high data rate audio/video stream of MPEG X like compressed digital video signals, and also at the same time a very low rate much higher resolution still photograph stream of JPEG X like still suspect photographs with first application means for post-crime suspect identification and capture, and with second application means for professional filming for commercial entertainment movies and shows.

2. The invention of claim 1 whereby the passively, auto-focused camera lens may be of a unit count of two with one closed loop servo-motor controlled lens dedicated to a specialized MPEG X like charge coupled device (CCD) and one closed loop servo-motor controlled lens dedicated to a specialized JPEG X like charge coupled device (CCD).

3. The invention of claim 1 whereby the transmissive motion sensors are example means of infrared diode (IR) emitters arranged in a focal plane array, furthermore, the infrared diodes are aimed outwards at all directions.

4. The invention of claim 1 whereby the transmissive motion sensors are example means of infrared (IR) heat diode emitters

arranged in a focal plane array aimed at different outwards directions, furthermore the reflected off a moving target infrared heat hot spot is received by a combined infrared and visible light MPEG like CCD sensitive to reflected heat images.

5. The invention of claim 1 whereby the micro-processor with separate elements of an input and output (I/O) bus, furthermore with separate elements of interrupt and timing circuitry keeps a means for suspect computer motion modeling by software algorithm using the input data from the combined infrared and visible light MPEG like CCD of both still and moving heat image CCD coordinates of (x, y, image heat intensity, time, optional z-axis range using a machine vision algorithm).

6. The invention of claim 1 whereby the closed loop servo-motor controlled passively auto-focused camera lens optimized for wide-angle motion video use, receives from the micro-processor's computer motion model the motor controls for a single suspect of interest and does micro-processor bus latch to discrete analog control circuitry lens motion.

7. The invention of claim 1 whereby the closed loop servo-motor controlled passively auto-focused camera lens optimized for wide-angle still photographic use, receives from the micro-processor's computer motion model the motor controls for a single suspect of interest and does micro-processor bus latch to discrete analog control circuitry lens motion.

8. The invention of claim 1 whereby the analog to digital converter (ADC) converts all CCD output from analog to digital with means for processing groups of video rows (macro-blocks) of a single movie frame conversion, furthermore with means for processing groups of video rows of a single still frame, furthermore with means processing audio streams of data.

9. The invention of claim 1 whereby the MPEG X like digital compression circuitry has means for processing rows of video (macro-blocks) from a single movie frame, furthermore it has means for color model conversion, furthermore it has means for a digital compression algorithm which can distinguish 'visually unimportant data' for selective drop out in lossy data compression, furthermore it has means for adding error detection and correction parity bits, furthermore it has means for using the micro-processor bus to deposit the groups of video rows (macro-blocks) into DRAM memory in an eventual complete movie frame which is given the MPEG X like 'presentation time stamp,' furthermore the MPEG X like chip inputs digital sound from two audio analog to digital converters (ADC's) and digitally compresses the two channels using the MPEG X like audio digital compression standard for audio stream output with MPEG X like 'presentation time stamps.'

10. The invention of claim 1 whereby the JPEG X like

digital compression circuitry has means for processing rows of video from a single still picture frame, furthermore it has means for color model conversion, furthermore it has means for a digital compression algorithm which can distinguish 'visually unimportant data' for selective drop out in lossy data compression, furthermore it has means for adding error detection and correction parity bits, furthermore it has means for using the micro-processor bus to deposit the groups of still picture rows into DRAM memory in an eventual complete still picture frame which has the MPEG X like 'presentation time stamp.'

11. The invention of claim 1 whereby the dynamic random access memory (DRAM) is used for temporary data store of actions with micro-processor means for collecting from both the MPEG X like and JPEG X like digital compression chips the groups of rows of video for a single frame until a completed either movie MPEG X like frame or still picture JPEG X like frame is assembled, furthermore with means collecting a MPEG X like digitally compressed audio stream, furthermore with means for MPEG X like control stream assembling the various streams into a hybrid output data stream called the new with this invention the proposed MPEG IV Level S1/E1 which furthermore uses an efficient frame re-ordering means.

12. The invention of claim 1 whereby the electrically erasable programmable read only memory (EEPROM) has means for permanent computer program store.

13. The invention of claim 1 whereby the first in first out buffer (FIFO) is used to connect an input and output (I/O) bus device to computer memory.

14. The invention of claim 1 whereby the output audio and video stream recorded is a new with this invention proposed MPEG X like level called the new proposed MPEG IV level S1/E1 format for security level 1 1<sup>st</sup> means, furthermore for entertainment level 1 2<sup>nd</sup> means, furthermore using hybrid MPEG X like digitally compressed audio/video along with a much lower rate stream of still JPEG like digitally compressed, higher resolution, photos.

15. The invention of claim 13 whereby the new proposed MPEG X level S1/E1 for security level 1 1<sup>st</sup> means, furthermore for entertainment level 1 2<sup>nd</sup> means, furthermore holds digital data with example means being GPS satellite navigation date, GPS time accurate to 1 micro-second at the recording, GPS latitude, GPS longitude, GPS altitude, delta GPS position, attitude data from an inertial reference unit (stick plane data), video channel data, pilot text notes, terrain map data, interactive television guide data in a "silhouette-like" cryptography technique in potentially every frame using static background areas to store data.

16. The invention of claim 1 whereby the removable permanent

memory device is a digital video tape cassette.

17. The invention of claim 1 whereby the removable permanent memory device is remotely connected to the video camera through a video local area network (video-LAN) with a first example means being a broadband cable network.

18. The invention of claim 1 whereby the removable permanent memory device is remotely connected to the video camera through a video local area network (video-LAN) with a second example means being a fiber optic network.

19. The invention of claim 1 whereby the power supply is a nickel cadmium ("ni cad") battery re-charged by a separate power line in the video local area network (V-LAN).

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20. I claim an invention which is specialized for use in a medium cost, medium security environment with both unattended and attended operation with means to monitor only several moving suspects where specialized post-crime, suspect identification is desired using digital, audio/video security recording which is composed of the elements of:

a camera body,

a closed loop servo-motor controlled passively auto-focused camera lens optimized for motion video use, furthermore with means for use as a gain-box (G-box),

a closed loop servo-motor controlled passively auto-focused camera lens optimized for still photographic use, furthermore with means for use as a gain-box (G-box),

a focal plane array based transmissive motion sensor which aims out in different directions,

a single receiver using a dedicated both infrared and visible light charge coupled device (focal plane CCD),

a micro-processor with means for output compressed digital data stream final assembly, furthermore with means for very rapid closed

loop servo-motor control processing of the H-boxes and the G-boxes,  
furthermore with means for suspect motion computer modeling,

peripheral input and output (I/O) bus and timing circuitry,

micro-processor input/output I/O peripheral chips,

a passively focused Moving Picture Expert's Group X like (MPEG X-like) optimized both infrared and visible light receptive charge coupled device (MPEG-like CCD) which is used with means as a hold-box (H-box) signal generator for closed loop servo motor control algorithms executed in the micro-processor used in lens servo-motor control,

micro-processor input/output I/O peripheral chips,

a passively focused Moving Picture Expert's Group X like (MPEG X-like) optimized both infrared and visible light receptive charge coupled device (MPEG-like CCD) which is used with means as a hold-box (H-box) signal generator for closed loop servo motor control algorithms executed in the micro-processor used in lens servo-motor control,

a passively focused Joint Photographer's Expert's Group like (JPEG-like) optimized visible light receptive charge coupled device (JPEG CCD) which is used with means as a Hold-box (H-box) signal

generator for closed loop servo motor control algorithms executed in the micro-processor used in lens servo-motor control,

analog to digital converters (ADC's),

a simultaneous-mode MPEG X/JPEG X digital compression circuit,

dynamic random access memory (DRAM) for temporary data store with means for holding large 6 mega pixel JPEG X-like frames,,

electrically erasable programmable read only memory (EEPROM) for permanent computer program store,

static RAM (SRAM) for small amounts of fast micro-processor program variables storage,

a first in first out buffer (FIFO),

a removable permanent memory device for digital data with first example means of a digital video tape cassette,

a power supply,

which elements are electronically and mechanically combined together into a specialized, hybrid simultaneously recorded JPEG like and MPEG X like digital audio/video camera, which furthermore simultaneously produces a high data rate audio/video stream of MPEG X like

compressed digital video signals, and also at the same time a very low rate much higher resolution still photograph stream of JPEG X like still suspect photographs with first application means for post-crime suspect identification and capture, and with second application means for professional filming for commercial entertainment movies and shows.

21. The invention of claim 20 whereby the passively, auto-focused camera lens may be of a unit count of two with one closed loop servo-motor controlled lens dedicated to a specialized MPEG X like charge coupled device (CCD) and one closed loop servo-motor controlled lens dedicated to a specialized JPEG X like charge coupled device (CCD).

22. The invention of claim 20 whereby the focal plane array based motion sensor has infrared (IR) heat diode emitters aimed outwardly at all different directions with a redundant infrared (IR) charge coupled device integrated with a visible light charge coupled device (focal plane CCD) to pick up both reflected heat and visible light image of a moving suspect.

23. The invention of claim 22 whereby the micro-processor/micro-controller with input and output (I/O) bus and timing circuitry reads the combined infrared light and visible light charge coupled device's (focal plane CCD's) measured (x, y, image heat intensity, time) to maintain a computer motion model of all still or moving heat images.

24. The invention of claim 23 whereby the passively focused, infrared and visible light, charge coupled device (focal plane CCD) with lens feed-back circuitry, uses the stereo vision or 2-video channels to create a 3-dimensional computer image modeling to measure a standard foot ruled tape marking placed in the camera view at a user micro-processor/micro-controller programmed fixed distance at camera center with means to compute a three dimensional image 3-D computer model from which to micro-processor/micro-controller generate a computer 2-D slice across the z-axis gives the z-axis range to suspect estimates which it gives to the micro-processor/micro-controller to also maintain in the computer motion model.

25. The invention of claim 20 whereby the closed loop servo-motors for both the MPEG-X like lens and the JPEG-X like lens are fed by the micro-processor/micro-controller into their gain-boxes (G-boxes) the desired motor value to move the focal point of the lens with a rapid continuous course and then fine feed-back path which is called auto-focus.

26. The invention of claim 20 whereby the analog to digital converter (ADC) converts any analog output from first means of the MPEG-X like CCD, and second means of the JPEG-X like CCD, and third means of the line amplified analog audio signal from two micro-phones, from analog to digital.

27. The invention of claim 20 whereby a simultaneous-mode MPEG X/JPEG X digital compression circuit can simultaneously compress both separate streams of high rate and medium resolution per frame MPEG X and low rate and high resolution per frame JPEG X digital data.

28. The invention of claim 20 whereby the dynamic random access memory (DRAM) is used for temporary data store of large digital video data for buffered storage accessed by micro-processor/micro-controller means for collecting CCD to ADC digitized output of first example means of a single uncompressed digital JPEG still video frame, and second example means of a single uncompressed digital MPEG X moving video frame, and with micro-processor/micro-controller means for sending arbitrary rows of a single frame at once to the simultaneous-mode MPEG X/JPEG X compression circuit, and with micro-processor/micro-controller means for storing and assembling in DRAM both the MPEG X and JPEG X compressed digital data into an output data stream.

29. The invention of claim 20 whereby the electrically erasable programmable read only memory (EEPROM) has means for permanent computer program store.

30. The invention of claim 20 whereby the first in first out buffer (FIFO) is used to connect an input/output (I/O) bus device to computer memory.

31. The invention of claim 20 whereby the output data stream recorded is a new MPEG X extension called proposed MPEG X level S1/E1 for a first application means of security level 1, furthermore, as a second application means for entertainment level 1, furthermore, with means for hybrid storage of the proposed MPEG X level S1/E1 compressed digital format which is comprised of moving MPEG X like audio/video as well as higher resolution still JPEG X like digital still photographs.

32. The invention of claim 31 whereby the proposed MPEG X level S1/E1 data stream holds extra inserted digital data in a "silhouette-like" cryptography technique potentially in every frame for frame stamping using static background areas of the video with first example means being GPS date, second example means being GPS time to within 1 micro-second at the recording, third example means being GPS satellite navigation position stamps (point data), fourth example means being GPS satellite navigation delta position stamps (point movement data), fifth example means being inertial reference unit angle data ('stick airplane data'), sixth example means being inertial reference unit translation data ('velocity data'), seventh example means being video camera channel.

33. The invention of claim 20 whereby the removable permanent memory device is a digital video tape cassette.

34. The invention of claim 20 whereby the removable permanent recording device is remotely connected through a video local area network with an example means being a broadband cable network.

35. The invention of claim 20 whereby the removable permanent recording device is remotely connected through a video local area network (V-LAN) with an example means being a fiber optic network.

36. The invention of claim 30 whereby the power supply is attached to the video local area network and is delivered over power pins.

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37. I claim an invention which is specialized for use in a low cost, low security environment with both unattended and attended operation with means to monitor at most several moving suspects where means for specialized post-crime, suspect identification is desired using means of digital, audio/video security recording which is composed of the elements of:

a camera body,

a closed loop servo-motor controlled passively auto-focused camera lens,

a transmissive motion sensor which aims out in at least one direction,

a passively focused both infrared and visible light receptive charge coupled device (CCD) which is used with means as a signal generator for closed loop servo motor control algorithms used in lens servo-motor control,

an analog to digital converter,

a micro-processor/micro-controller with means for output compressed digital data stream final assembly, furthermore with means for very rapid multi-cycle closed loop servo-motor control

processing for the lens assembly, furthermore with means for suspect motion computer modeling,

peripheral input and output (I/O) bus and timing circuitry,

micro-processor input/output I/O peripheral chips,

analog to digital converters (ADC's),

a digital compression circuit,

dynamic random access memory (DRAM) for temporary data store with means for holding large 6 mega pixel JPEG X-like frames,,

electrically erasable programmable read only memory (EEPROM) for permanent computer program store,

static RAM (SRAM) for small amounts of fast micro-processor program variables storage,

a removable permanent memory device for digital data with first example means of a digital video tape cassette, and second example means being a memory card,

a power supply,

which elements are electronically and mechanically combined together into a specialized, hybrid simultaneously recorded JPEG X like and MPEG X like digital audio/video camera, which furthermore simultaneously produces a high data rate audio/video stream of MPEG X like compressed digital video signals, and also at the same time a very low rate much higher resolution still photograph stream of JPEG X like still suspect photographs with first application means for post-crime suspect identification and capture, and with second application means for professional filming for commercial entertainment movies and shows.

38. The invention of claim 37 whereby the passively, auto-focused camera lens may be of a unit count of two with one closed loop servo-motor controlled lens dedicated to a specialized MPEG X like charge coupled device (CCD) and a second closed loop servo-motor controlled lens dedicated to a specialized JPEG X like charge coupled device (CCD).

39. The invention of claim 37 whereby the motion sensor emitter has a infrared (IR) heat diode emitter aimed outwardly in at least one direction.

40. The invention of claim 39 whereby the micro-processor/micro-controller with input and output (I/O) bus and timing circuitry reads the combined infrared light and visible light charge coupled device's measured (x, y, image heat

intensity, time) to maintain a computer motion model of all still or moving heat images.

41. The invention of claim 39 whereby the closed loop servo-motors for both the MPEG-X like lens and the JPEG-X like lens are fed by the micro-processor/micro-controller into their gain-boxes (G-boxes) the desired motor value to move the focal point of the lens with a rapid continuous course and then fine feed-back path which is called auto-focus.

42. The invention of claim 39 whereby the analog to digital converter (ADC) converts any analog output from first means of the MPEG-X like CCD, and second means of the JPEG-X like CCD, and third means of the line amplified analog audio signal from two micro-phones, from analog to digital for micro-processor/micro-controller bus reading and eventual digitizing.

43. The invention of claim 39 whereby a simultaneous-mode MPEG X/JPEG X digital compression circuit can simultaneously compress both separate streams of high rate and medium resolution per frame MPEG X and low rate and high resolution per frame JPEG X digital data as well as very low rate MPEG X two-channel audio data.

44. The invention of claim 39 whereby the dynamic random access memory (DRAM) is used for temporary data store of large digital video data for buffered storage accessed by micro-

processor/micro-controller means for collecting the CCD joined with ADC digitized output of first example means of completed JPEG X like standard rows of a single uncompressed digital JPEG still video frame, and second example means of completed rows of MPEG X like standard macro-block rows of a single uncompressed digital MPEG X moving video frame, and with micro-processor/micro-controller means for sending arbitrary numbers of standard rows of a single frame at once to the simultaneous-mode MPEG X/JPEG X compression circuit, furthermore with micro-processor/micro-controller means for storing and assembling in DRAM a MPEG X like control stream along with both the MPEG X like and JPEG X like compressed digital data into an output data stream.

45. The invention of claim 39 whereby the electrically erasable programmable read only memory (EEPROM) has means for permanent computer program store.

46. The invention of claim 39 whereby the output data stream recorded is a new MPEG X extension called proposed MPEG X level S1/E1 for a first application means of security level 1, furthermore, as a second application means for entertainment level 1, furthermore, with means for hybrid storage of the proposed MPEG X level S1/E1 compressed digital format which is comprised of a MPEG X like control stream, furthermore high rate and medium resolution moving MPEG X like audio/video with MPEG X like presentation time stamps, furthermore low rate and higher

resolution still JPEG X like digital still photographs with MPEG X like presentation time stamps, furthermore additional data streams of interest with MPEG X like presentation time stamps.

48. The invention of claim 47 whereby the proposed MPEG X level S1/E1 data stream holds extra inserted digital data in a 'silhouette-like' cryptography technique potentially in every frame using static background areas of the video with 1<sup>st</sup> example means being GPS satellite navigation date stamps, very accurate time stamps, and position stamps.

49. The invention of claim 37 whereby the removable permanent memory device is a digital video tape cassette.

50. The invention of claim 37 whereby the removable permanent recording device is remotely connected through a video local area network with an example means being a broadband cable network.

51. The invention of claim 37 whereby the removable permanent recording device is remotely connected through a video local area network (V-LAN) with an example means being a fiber optic network.

52. The invention of claim 37 whereby the power supply is attached to the video local area network and is delivered over power pins.